

CLAIMS:

1. A dry etching apparatus, comprising:

a chamber;

a tray provided inside said chamber;

5 a substrate to be etched, placed on a substrate-placing surface of said tray; and

a plate provided with a number of opening portions and prepared to cover said substrate to be etched,

10 wherein said plate is arranged in such a manner that, while covering said substrate to be etched, a distance between a surface opposing said substrate to be etched and said substrate to be etched in a peripheral portion is shorter than a distance between the surface opposing said substrate to be etched and said substrate to be etched in a central portion.

15 2. The dry etching apparatus according to Claim 1, wherein the surface of said plate opposing said substrate to be etched forms a concave or nearly concave plane as a whole.

20 3. The dry etching apparatus according to Claim 2, wherein the surface of said plate opposing said substrate to be etched forms a step-like structure.

4. The dry etching apparatus according to Claim 3, wherein chamfering is applied to a step portion in the step-like structure.

25 5. The dry etching apparatus according to Claim 2 wherein a thickness of said plate is thicker in the peripheral portion

than in the central portion.

6. The dry etching apparatus according to Claim 1, wherein the substrate-placing surface of said tray forms a concave or nearly concave plane as a whole.

5 7. The dry etching apparatus according to Claim 6, wherein the substrate-placing surface of said tray forms a step-like structure.

8. The dry etching apparatus according to Claim 7, wherein chamfering is applied to a step portion in the step-like
10 structure.

9. The dry etching apparatus according to Claim 6, wherein a thickness of said tray is thicker in a peripheral portion than in a central portion.

10. The dry etching apparatus according to Claim 1, wherein
15 a distance between said plate and said substrate is 5 to 30 mm.

11. The dry etching apparatus according to Claim 1, wherein said plate is made of metal.

12. The dry etching apparatus according to Claim 11,
wherein said plate is made of aluminum.

20 13. A dry etching method for etching a surface of a substrate to be etched, said method comprising:

placing a substrate to be etched on a substrate-placing surface of a tray provided inside a chamber; and

25 covering said substrate to be etched with a plate provided with a number of opening portions,

wherein a distance between a surface opposing said substrate to be etched and said substrate to be etched in a peripheral portion of said plate is set shorter than a distance between the surface opposing said substrate to be etched and 5 said substrate to be etched in a central portion of said plate.

14. The dry etching method according to Claim 13, wherein said dry etching method is a reactive ion etching method.

15. A plate used in a dry etching apparatus to cover a substrate to be etched, placed on a substrate-placing surface 10 of a tray provided inside a chamber, said plate having:

a number of opening portions; and

a surface opposing said substrate to be etched and being shaped into a concave or nearly concave plane as a whole.

16. A tray used for a dry etching apparatus and provided 15 inside a chamber so that a substrate to be etched is placed thereon while said substrate to be etched is covered with a plate, said tray having:

a substrate-placing surface shaped into a concave or nearly concave plane as a whole.

20 17. A dry etching apparatus, comprising:

a chamber;

a tray provided inside said chamber;

a substrate to be etched, placed on a substrate-placing surface of said tray; and

25 a plate provided with a number of opening portions and

prepared to cover said substrate to be etched,
wherein said plate is provided with a protruding wall on
a surface opposing said substrate to be etched.

18. The dry etching apparatus according to Claim 17,
5 wherein said protruding wall is formed in a shape of a cross
when said plate is viewed in a plane.

19. The dry etching apparatus according to Claim 17,
wherein said protruding wall abuts on the substrate-placing
surface of said tray.

10 20. A dry etching method etching a surface of a substrate
to be etched, said method comprising:

placing a substrate to be etched on a substrate-placing
surface of a tray provided inside a chamber; and

15 covering said substrate to be etched with a plate provided
with a number of opening portions,

wherein a protruding wall is provided to said plate on
a surface opposing said substrate to be etched.

21. The dry etching method according to Claim 20, wherein
said dry etching method is a reactive ion etching method.

20 22. A plate used in a dry etching apparatus to cover a
substrate to be etched, placed on a substrate-placing surface
of a tray provided inside a chamber, said plate having:

a number of opening portions; and

a protruding wall formed at least in a peripheral portion

25 of a surface opposing said substrate to be etched.